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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,541	07/28/2006	Yoshiyuki Nasuno	900-559	8895
23117 7590 03/03/2010 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
GARDNER, SHANNON M				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
03/03/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,541

Applicant(s)

NASUNO ET AL.

Examiner

Shannon Gardner

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 and 16-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GC/IB)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____
- Page No(s)/Mail Date 1/13/2010, 1/4/2010, 4/12/2007, 7/28/2006

DETAILED ACTION

Remarks

The Requirement for Restriction dated 12/18/2009 is withdrawn. New grounds of rejection are set forth below.

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-10, drawn to a substrate for a photoelectric conversion device with a transparent electrically conductive layer having at least one open section where the substrate is exposed.

Group II, claim(s) 11-15, drawn to a photoelectric conversion device with a substrate having an electrically conductive layer having at least one open section where the substrate is exposed.

Group III, claim(s) 16-24, drawn to a photoelectric conversion device with an interlayer having at least one open section.

2. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: there is no common technical feature shared by Groups I, II and III.

3. During a telephone conversation with Warren Burnam on 2/25/10 a provisional election was made without traverse to prosecute the invention of Group II, claims 11-15. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 1-10 and 16-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, it is unclear as to how Applicant intends "a second intermediate layer between the first intermediate layer and the photoelectric conversion layer thereon, the second intermediate layer covering the opening portion of the first intermediate layer" to depend from claim 13 that requires "the pair of the photoelectric conversion layers...come into contact with each other through the opening portion [of the first intermediate layer]". The Examiner notes that if the pair of photoelectric conversion layers is to come into contact with each other through the opening, then covering the opening with a second layer prohibits the photoelectric layers from coming

into contact. Appropriate correction is required. The Examiner notes that claim 14 is so unclear that it precludes examination on the merits.

Claim 15 is dependent upon claim 14 and therefore rejected for the same reasons as listed above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 2002/0050289) in view of Fujisawa et al. (WO/2003/017378, cited in IDS; references are made to US 2004/0155236 as the English equivalent of the WIPO document).

As to claim 11, Wada is directed to a photoelectric conversion device (Figure 3) comprising:

- A photoelectric conversion layer (34) and
- A backside electrode (36) stacked in this order (see Figure 3 for configuration) on a substrate (31)

Wada is silent as to the substrate comprising a first transparent conductive layer formed on at least a part of the surface region of a substrate, the first transparent conductive layer having at least an opening portion exposing the substrate.

However, it is known in the solar cell art to utilize a substrate (5) having a first transparent conductive layer ('undercoating', 1) formed on at least a part of the surface region such that the first transparent conductive layer ('undercoating', 1) has at least an open portion exposing the substrate ('hole', 6) to ensure light trapping as taught by Fujisawa (Figure 1, paragraph [0003] and [0023]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the substrate having a transparent conductive coating in

the photoelectric conversion device of Wada to ensure better light trapping as taught by Fujisawa.

Regarding claim 12, modified Wada teaches a stacked photoelectric conversion layer (Figure 3) comprising a plurality of photoelectric conversion layers (32 and 34) and a backside electrode layer (36) stacked in this order on a substrate (31), a first intermediate layer (33) sandwiched between at least a pair of adjacent two photoelectric conversion layers (32 and 34) (see Wada; Figure 3 and paragraphs [0220]-[0225]).

Wada is silent as to the substrate comprising a first transparent conductive layer formed on at least a part of the surface region of a substrate, the first transparent conductive layer having at least an opening portion exposing the substrate.

However, it is known in the solar cell art to utilize a substrate (5) having a first transparent conductive layer ('undercoating', 1) formed on at least a part of the surface region such that the first transparent conductive layer ('undercoating', 1) has at least an open portion exposing the substrate ('hole', 6) to ensure light trapping as taught by Fujisawa (Figure 1, paragraph [0003] and [0023]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the substrate having a transparent conductive coating in the photoelectric conversion device of Wada to ensure better light trapping as taught by Fujisawa.

Regarding claim 13, modified Wada does not specifically teach the first intermediate layer having at least an opening portion, and the pair of the photoelectric conversion layers sandwiching the first intermediate layer therebetween come into

contact with each other through the opening portion. But, Wada does teach the intermediate layer being deposited via CVD or sputtering (paragraph [0225]) such that the layer is 1nm to 50nm thick (paragraph [0227]).

It is the Examiner's position that a deposition of a 1nm thick film by CVD results in a non-uniform layer wherein portions of the layer will be significantly thinned such that they read on the instant "opening portion" (as defined by Applicant's Specification paragraph [0043]).

Therefore, one of ordinary skill in the art would understand that the intermediate layer of modified Wada reads on the instant claim. Further, at the opening portions of the intermediate layer of Wada, the adjacent photoelectric layers will inherently come into contact with each other.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shannon Gardner whose telephone number is (571)270-5270. The examiner can normally be reached on Monday to Thursday, 5am-3pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571.272.1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. G./
Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795